

WHAT IS CLAIMED IS:

1. A stacked photovoltaic element comprising a plurality of unit photovoltaic elements each composed of a pn- or pin-junction, connected to each other in series, wherein a zinc oxide layer is provided at least one position between the unit photovoltaic elements, and the zinc oxide layer has resistivity varying in a thickness direction thereof.
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- 10 2. The stacked photovoltaic element according to Claim 1, wherein zinc oxide of the zinc oxide layer on a side of being in contact with a p-layer of the pn- or pin-junction has a higher resistivity than that on a side of being in contact with an n-layer of the pn- or pin-junction.
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- 20 3. The stacked photovoltaic element according to Claim 2, wherein a resistivity of the zinc oxide continuously decreases in the zinc oxide layer from a side of the zinc oxide layer in contact with the p-layer towards a side of the zinc oxide layer in contact with the n-layer.
- 25 4. The stacked photovoltaic element according to Claim 1, wherein a resistivity of zinc oxide of the zinc oxide layer is 2×10^0 Ωcm or more but 5×10^3 Ωcm or less.

5. The stacked photovoltaic element according to Claim 1, wherein a high resistant portion of zinc oxide of the zinc oxide layer has 5×10^2 Ωcm or more but 5×10^3 Ωcm or less.

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6. The stacked photovoltaic element according to Claim 1, wherein at least one of the plurality of the unit photovoltaic elements has a pin-junction comprising an i-type layer composed of amorphous Si:H.

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7. The stacked photovoltaic element according to Claim 1, wherein at least one of the plurality of the unit photovoltaic elements has a pin-junction comprising an i-type layer composed of microcrystalline Si.

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8. The stacked photovoltaic element according to Claim 1, wherein at least one of the plurality of the unit photovoltaic elements has a pin-junction comprising an i-type layer composed of single-crystalline or poly-crystalline Si.

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9. A method for producing a stacked photovoltaic element comprising an intermediate layer between photovoltaic elements each having a pn- or pin-junction, wherein a first layer mainly composed of indium oxide is stacked on at least one interface

with the photovoltaic element and then a second layer mainly composed of zinc oxide is stacked on the first layer to form the intermediate layer.

5 10. The method according to Claim 9 for producing a stacked photovoltaic element, wherein the second layer is formed to be thicker than the first layer.

10 11. The method according to Claim 9 for producing a stacked photovoltaic element, wherein the first layer is formed to have a thickness of 1 nm or more but 50 nm or less.

15 12. The method according to Claim 9 for producing a stacked photovoltaic element, wherein the second layer is formed at a rate higher than that of the first layer.

20 13. The method according to Claim 9 for producing a stacked photovoltaic element, wherein the second layer is formed at a temperature lower than that of the first layer.

25 14. A stacked photovoltaic element comprising an intermediate layer between photovoltaic elements each having a pn- or pin-junction, wherein the

intermediate layer comprises a first layer and a second layer stacked in this order on at least one interface with a photovoltaic element, the first layer being mainly composed of indium oxide and the
5 second layer being mainly composed of zinc oxide.

15. The stacked photovoltaic element according to Claim 14, wherein the second layer is thicker than the first layer.

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16. The stacked photovoltaic element according to Claim 14, wherein the first layer has a thickness of 1 nm or more but 50 nm or less.

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17. The stacked photovoltaic element according to Claim 14, wherein the second layer has a higher transmittance than the first layer at a wavelength of 800 nm.